

CONFIDENTIAL.

COLONIAL DEFENSIVE ORGANIZATION.

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PRECIS OF INFORMATION

CONCERNING THE

PROVINCE OF QUEBEC,

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PREPARED FOR THE INTELLIGENCE BRANCH OF THE QUARTER MASTER
GENERAL'S DEPARTMENT, HORSE GUARDS, WAR OFFICE, 1876,

BY

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Inspector of Artillery for the Dominion.



QUEBEC.

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1876.

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COLONIAL DEFENSIVE ORGANIZATION.

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FOR INTELLIGENCE BRANCH QUARTER MASTER
GENERAL'S DEPARTMENT, HORSE GUARDS,
WAR OFFICE.

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PROVINCE OF QUEBEC.

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SECTION A.

GEOGRAPHY.

PHYSICAL GEOGRAPHY.

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As my inspections have been officially restricted, (until the current year,) to the Province of Quebec, I will limit myself thereto in my report:—

Its area is about the same as that of France, 210,020 square miles, a great part of it is, however, still covered with forest, trending northward as far as the limit of growth. The cultivated portion, 11,025,786 acres Tache's Official Census, 1871. along the St. Lawrence, is seldom more than 100 miles in breadth. Owing to the severity of the climate the north bank of the St. Lawrence, below the Saguenay, is almost incapable of cultivation. The population of the Province is (from the census of 1871) 1,191,516. It lies between latitude 53° north and 45° south, and longitude 79° and 55°; bounded on the east by the Atlantic, on the north by the solitudes of Baffin's Bay

and Hudson Bay, on the west by the Ottawa River, and on the south by New Brunswick and the arbitrary boundary of the State of Maine—a wedge which the Ashburton Treaty in 1842 allowed to be thrust into British Territory, to within 30 miles of the St. Lawrence. The parallel of 45° is the boundary from the Connecticut River in New Hampshire, U. S., to the head of Lake St. Francis, an enlargement of the St. Lawrence.

It was a grave mistake for several reasons, not to style Quebec the "Province of St. Lawrence," for it is simply the basin of that mighty river, before it expands into inland seas. The northern watershed, formed by the great Laurentian chain, sends to it the River Ottawa, 550 miles, with its tributaries the Gatineau, &c., the St. Maurice, the Saguenay, 350 miles, the Betsiamet, and the Moisie. The Laurentides, (*i. e.*) the chains of the Adirondack, the Vermont and the White Mountains in the United States, send to the St. Lawrence the Chateauguay, the Richelieu, St. Francis and Chaudière. The southern watershed is completed by the Notre Dame Mountains, drained to the north by the River du Loup, the Metis, and other comparatively short streams, which intersect by their deep channels the table land of the Peninsular of Gaspé and Rimouski, known as the Shick Shock and St. Anne mountains, from 1500 to 4000 feet in height, also of the Laurentian family. Indeed the physical conformation of the Province is extremely simple and well defined, being the basin of the St. Lawrence as formed by the watershed of the Laurentian chains on the north and south shores. The backbone of this system is the Laurentides proper, which extend from Labrador, along the north shore of the St. Lawrence to Cap Tourmente [2000 feet] within 20 miles of Quebec, where they leave the river and turn inland, widening its watershed, running 30 miles north of Montreal and then skirting the Ottawa for about 100 miles, finally reach the Arctic Ocean after a course of 3500 miles, north of the line commencing at Cap Tourmente is a second step of the same great chain running N. E., and forming the watershed which separates the valley of Lake St. John, the sources of the Saguenay and St. Maurice, from those of great rivers running to the Arctic Sea.

GEOLOGY, &c.

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Both the northern and southern Laurentides are composed of sedimentary rocks in altered condition, those of the north presenting a more crystalline character. They are also the most ancient, being of the Azoic era, while those of the south are palæozoic.

"The strata of both ranges are very much corrugated. In the southern mountains the axes of the folds run parallel with the range, and the hills and valleys for the most part coincide with these bearings. Some of the axes have been traced considerable distances, and though parallel with one another, do not appear to maintain straight lines, but assume as they proceed, great sinuous sweeps. Following them from the extremity of Gaspé, they strike into the land, with a north west bearing, which gradually rounds to west in the vicinity of St. Anne des Monts and La Chatte; further on, they by degrees assume a nearly south west course, and again turn more west for a short distance after passing the Chaudière; but once more bending to the south-west, their course becomes nearly south as they quit the province, amid the Green Mountains. In one part or other of the range, rocks of all the divisions of the palæozoic period, from the lower Silurian to the Carboniferous, appear to be involved in the folds, and though in some places there is a want of conformity between the Lower and Upper Silurian, and between the Devonian and Carboniferous, there is no want of parallelism in the axes of the folds throughout the whole, showing that the forces which produced them continued in operation in the same directions, during nearly the whole of the palæozoic period."

Logan, Chap. I.
Structure of
Notre Dame
Mountains.

"In the Canadian part of the range, it is the inferior deposits of this period that present the highest peaks. To these deposits, appear to belong the Shick Shock Mountains, which, in ascending the St. Lawrence, towards Quebec, are the highest that are displayed to view on the south side.

The whole of the Gaspé peninsula may be considered a block of table land of about 1500 feet in height, in which the river courses are deep and narrow excava-

Heights of
Mountains.

tions. Upon this the Shick Shock mountains are a conspicuous range of highlands, extending about 65 miles from the east side of the St. Anne des Monts to the Matanne. They stand on a breadth of from 2 to 6 miles at a distance of about 12 miles from the St. Lawrence and rise into points, attaining heights of between 3000 and 4000 feet. But though the highest land they do not form strictly the watershed of the peninsula; for the St. Anne des Monts, the Chatte, and the Matanne taking their sources on lower land to the south. The gorges through them so deep, that their channels, when they cross the range, are not more than between 500 and 600 feet above the St. Lawrence. The waters of one branch of the Matanne have their source on lower ground on the north side of the range, and flow south through a profound gap to join the main stream, then crossing the range twice in their course to the great River."

Lakes of
Notre-Dame
Mountains.

"In the same part of the geological series are the Ronans Mountain in Buckland and White Mountain in Coleraine, each about 25 miles from the Chaudière on opposite sides and about 40 miles from its mouth, as well as Ham and Orford or Victoria Mountains, some 20 to 25 miles from opposite sides of the St. Francis, with Owl's Head and Sutton Mountains, the whole being the highest series of summits along the range to the Province line, some of them supposed to equal in elevation the peaks of Gaspé. As in the case of the smaller streams cutting the Shick Shock Mountains, the Chaudière and the St. Francis, which are two of the largest tributaries on the south side of the St. Lawrence, traverse this portion of the range; gathering the greater part of their waters from lands to the south, through the valleys running with the strikés. Except near the watershed, the valleys of the principal streams do not obtain a greater elevation than from 500 to 900 feet above the St. Lawrence. They present but few abrupt cascades, and though no less than sixteen ponds of larger sheets of water are included in the panorama from the top of Orford Mountain, it cannot be said that on the whole, the Canadian part of the southern range abounds in lakes. The greatest of these with the

areas and approximate heights above the sea, are:

	Height.	Area.	
Memphramagog	756 feet,	37 sq. miles.	Heights and area.
Aylmer	795 "	9 "	
St. Francis	890 "	12 "	
Megantic	"	17 "	
Temiscouata	467 "	24 "	
Matapedia	480 "	12 "	

The hills, exclusive of the summits of the highest ridge, seldom exceed from 1000 to 1500 feet, and the country connected with the Canadian part of the range, presenting a rolling rather than a rugged mountainous surface, is for the most part, particularly what is called the Eastern Townships, capable of tillage or pasture and is in general found to constitute a useful agricultural area."

"The northern range, belonging, as has already been stated, to the azoic period, is composed in Canada, of two series of rocks, which has been termed, the Huronian and the Laurentian, the former overlying the latter. The Laurentian folds which have been investigated, appear to hold courses wholly independent of the Huronian, the chief part of them being north or a few degrees removed from it. The plications appears to be sharp and numerous; and as the bearing of their axes would be transverse to the general bearing of the range, while supposed equivalent rock-masses belonging to it are nevertheless found towards both extremes of the province, as well as in intermediate parts, it seems probable that the outcrops of the strata will exhibit a very deeply serrated or zigzag arrangement in their geographical distribution, and that the bearings of the mountains and valleys will conform to them. The general elevation of the Laurentides may be given at about 600. Height of Laurentides.

"The surface which the range presents is of a mamillated character, its hills being worn by glacial action into round backed forms in general thickly clothed with wood, the prevailing trees on the summits, being evergreens in some part chiefly pine, and in others spruce, while hardwood sometimes abounds on the lower elevations and in the valleys. The valleys are in general not

very wide, and many are worn into deep pits holding ponds and lakes: some streams indeed are nothing more from their sources to their mouths than a chain of such quiet expansions, united by short discharging channels. The prodigious number of these sheets of water, great and small bespangling the whole area, is one of its most remarkable features, and when looked upon as displayed on a map, they appear so scattered at random over the surface as to contradict almost any supposed law of distribution. Some of the clusters however that have been examined in connection with their geology are most beautifully explained by the peculiar geographical distribution of the strata which results from their very corrugated condition, combined with the unequal wear occasioned by the hardness and roughness of some parts, and the softness of others, in the sequence of the metamorphosed deposits. In the Laurentides district, a straight line can scarcely be followed in any direction for a great distance without the occurrence of one of these expansions; and it frequently happens that it will present a considerable area even where discharging by a very slender outlet. The profusion in which the lakes exists, with, in some instances only a short interval of land between them, though they may belong to different river systems, affords with the aid of birch bark canoes, a ready means of passing from one navigable stream to another, in whatever part an explorer may be; and thus if he is well acquainted with the country, he can reach almost any position he may wish to attain without any very great deviation from a direct route. Although a large number of the rivers of the Canadian portion of the Laurentides is still unknown, or only partially explored, upwards of a thousand of these lakes are represented on the published maps of the country. It is only a few of them, however, that are sufficiently large to deserve special mention.

The best known are:

	Feet.	Square mile
St. John	300	360
Grand Lac.....	700	560
Temiscamang	612	126

"From the opposing flanks of the Laurentians in Canada and the Appelanchian mountains in the U. S.

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extends a vast intermediate plain the limit of which westward is the Rocky mountains. There are few exceptions to the general level, the most remarkable being the step which produces the world renowned Falls of Niagara. In Eastern Canada, 6 or 7 isolated trap mountains break the general level which here commences, they vary in height, from 500 to 1800 feet, and are all visible from the Hill near Montreal which is one of them.

"The ores of iron, of economic importance in Canada, are the magnetic oxyd, the anhydrous peroxyd, and the hydrous peroxyd, the carbonate of iron has not been observed in any considerable quantity; and the sulphuret, which is not used as an ore of iron, but is valuable for other purposes.

Logan,
Chap. XXI.
Iron.

The most abundant ore of iron in the province is probably the magnetic oxyd, or magnetite; which receives its name from the fact that it is attracted by the magnet. It is sometimes endowed with polarity, and then constitutes the native magnet or lodestone.

This ore has a specific gravity of a little over 5 times that of water, is iron black in color; and gives a black powder. It is hard, brittle, and with a shining more or less metallic luster. When pure, it consists of 72.4 parts of iron, and 27.6 parts of oxygen; but it often contains foreign matters, either mechanically mingled or chemically combined; which reduce it more or less to the percentage of the ore. The magnetic oxyd sometimes occurs in masses made up of coarse grains; at other times the ore is fine grained and almost compact; more rarely it occurs in regular octahedral crystals. This ore is found only in crystalline or metamorphic rocks, and the deposits of it in Canada occur in the Laurentian series, or in the crystalline rocks of the eastern palæozoic basin." There are large beds of the magnetic iron sand in the Moisie River, and a company has been started for melting it into ingots of steel by the addition of powdered charcoal, but the mechanical difficulties of applying blast have not, I believe, been altogether overcome. Bog iron ore in considerable quantities is spread along the north shore of the St. Lawrence between Montreal and Quebec; many of these deposits have long been known. The St. Maurice forges were established in 1837, but have of late been almost abandoned owing to

the growing scarcity of ore and charcoal in the immediate vicinity. The Bog ore iron when washed is from 40 to 50 per cent of metal. The Radnor forges have been celebrated for cast iron wheels for railway cars, the tires being chilled on the same principle as the Pallisier projectiles. Quebec, therefore, possesses in the crystalline ores of her Laurentian rocks, and in the iron slates of the Eastern Townships, inexhaustible supplies of rich ores which may compare with those of Sweden. It is from these magnetic and red hematite ores, reduced by charcoal, that the finest iron of the world is manufactured.

"It cannot be doubted that skilled labor and capital will one day make the iron mines of this Province great sources of wealth," though the absence of coal will prevent the production of the cheap and inferior qualities of cast iron. Government statistics for the year 1871 show the production of iron ore from the undermentioned localities to have been as follows:

Tache.

Ottawa West	1500 tons.
St Maurice	1107 "
Trois-Rivières	10957 "
Champlain South	1800 "
" North	6142 "
Yamaska	27342 "
Charlebois	2053 "

Logan,
Chap. XXVII.
Copper.

"The ores of copper observed in Canada are copper pyrites, the variegated sulphuret or erubescite, and the vitreous sulphuret or copper-glance, besides native copper, and small portions of the blue and green carbonates, and more rarely of the red oxyd. In the rocks of the Laurentian series, copper is frequently met with in the form of yellow sulphuret. The distribution of copper through the rocks of the Quebec group is very general, and seems to indicate that this metal was almost everywhere present in the waters from which these strata were deposited. The copper generally occurs in the form of one of the sulphuretted ores, but more rarely in the native state, or as red oxyd, or green or blue carbonate. The sulphurets are generally found in the beds in grains, plates and lenticular masses, some

times of considerable size. Occasionally, as in a portion of the Acton mine, the variegated and vitreous sulphurets from the cement of a conglomerate rock, enclosing masses and grains of chert and of limestone.

The ores of copper are not confined to any one division of the rocks of the Quebec group. Sometimes, as at Acton and Upton, they are in the dolomites, or, as in Ascot, in a chloritic limestone, while in many other localities they are found in micaceous or chloritic slates, or in steatite. Ores of copper are also disseminated in small portions through the slaty iron ores of Brome and Sutton; and small stains and flakes of the green carbonate are found among the slates and sandstones of the Quebec group, at Sillery and St. Nicholas. Red oxyd of copper occurs in cinnabar red stains upon blackish shales, at Acton.

Native copper has been found in thin plates, imbedded in a greenish layer running with the stratification, in the midst of a mass of red slates, near St. Henri, in the bed of the Etchemin River. Masses of native copper found in the ruins of the red slates from Point Levis, and in the drift in the Chaudière valley, have probably had a similar source. Small portions of native copper have also been met with in a bed of amygdaloidal diorite, at St. Flavien."

Government statistics for 1871 show the produce of copper for the undermentioned localities as follows:

Brome.....	4900 tons.	Tashe.
Shefford.....	300 "	
Arthabaska.....	40 "	
Sherbrooke.....	4836 "	
Megantic.....	1250 "	

"The only ore of lead met with in Canada is the sulphuret or galena. Small quantities of galena have been found in the black calcareous shales of the city of Quebec, in veins with white calcite and purple fluorspar. In various other parts of the Quebec group, galena has been met with, sometimes disseminated in the dolomites, and at others forming small layers or detached masses, generally granular in texture, and associated

Logan,
Chap. XVII.
Lead.

with the ores of copper as at Acton, Upton and Ascot. So far as yet examined, these ores contain but little silver. More highly argentiferous galena has, however, been found in small quantities in quartz veins, as at the rapids of St. Francis, on the Chaudière, and at Moulton Hill, near Lennoxville; in both cases with mispickel. Galena occurs in workable quantities in veins which traverse the Gaspé limestones at Cape Gaspé and Indian Cove."

Logan,
Chap. XVII.
Silver.

"The copper ores of the Eastern Townships frequently contain small portions of silver. It is well known that the native sulphuret of lead is almost never free from silver, which is sometimes present in so large a quantity as to constitute a silver ore. A vein which occurs at the rapids of the Chaudière, in St. Francis, Beauce, contains, in a gangue of quartz, argentiferous galena, blende, mispickel, besides cubic and magnetic pyrites, with minute grains of native gold. The native gold of the Eastern Townships is always alloyed with a certain portion of silver."

Mercury.

"The native gold obtained from the gravel of the Rivière du Loup is often found to be covered with a white coating of mercurial amalgam, and globules of running mercury are said to have been met with in washing the auriferous sand of this region."

Logan,
Chap. XVII.
Gold.

"The existence of gold in the sands of the Chaudière valley was first made known by Genl. Baddeley, R. E., in 1835. Of late years repeated examinations have shown that the precious metal is not confined to that region, but exists in the superficial deposits of a wide region on the south side of the St. Lawrence, extending from the St. Francis to the Etchemin rivers, and from the first line of hills on the north west to the province line on the south-east. The source of the gold appears to be the crystalline schists of the Notre Dame range; and the materials derived from their disintegration, not only constitute the superficial material among the hills of this range, but are spread over a considerable area to the south of them." The following are the products for Quebec—Compton 301 oz.; Beauce 3110 oz.

Tache.

Platinum.

"Grains of native platinum have been found in small quantities among the native gold of the Rivière du

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Loup, and also, it is said, in other localities in the same region."

"Under this head may be noticed the ordinary cubic sulphuret of iron, and the magnetic pyrites or pyrrhotine. Cubic pyrites is often found in the Laurentian gneiss and limestones, but seldom in finely crystallized varieties. Iron pyrites is occasionally found lining fissures in the lower Silurian limestones, and replacing fossils, in the Utica formation. In the Quebec group it forms concretionary masses, often several inches in diameter, among the schists near Cape Rouge and on the Island of Orleans. In the Eastern Townships, iron pyrites is sometimes associated with the ores of copper, as in Garthby; where a great bed which occurs in serpentine, is in some parts mingled with copper pyrites, and in others is nearly pure sulphuret of iron." A Sawdust Gunpowder, sulphuric acid factory has been established at Levis, Quebec, mainly supplied with sulphuret of iron from the Eastern Townships. This acid factory might be developed into a manufacture of sawdust gunpowder, which might be useful on emergency, in the event of communication east and west being cut off. The process of manufacture is exceedingly simple, inexpensive and free from danger.

ADMINISTRATIVE GEOGRAPHY.

QUEBEC.

The Province of Quebec, formerly Lower or Eastern Campbell. Canada, comprises the central portion of the Dominion of Canada, from the Ottawa River to the Gulf of St. Lawrence. The city of Quebec is the Capital and seat of Legislature. "The Province is divided into 20 judicial districts, and these are again subdivided into 60 counties. To assist the memory these may be classed thus:—Counties on the Ottawa; those on the North Bank of the St. Lawrence; those on the South Bank, and those lying inland between the latter and the United States, usually called the Eastern Townships.

Counties on the Ottawa.

Counties.	Chief Places.	Counties.	Chief Places.	
Pontiac.	Portage du Fort.	Jacques-	{ Island }	Lachine
Ottawa.	Aylmer, Hull,	Cartier,	{ of }	Montreal.
Argenteuil,	{ Lachute.	Hochelaga,	{ Mont'al }	
Two Mountains,	{ St. Andrews.	Laval,	{ Islands }	St. Vincent
Vaudreuil,	{ St. Scholastique		{ Jesus & }	de
Soulanges,	{ St. Eustache.		{ Bizarre, }	Paul.
	Vaudreuil.			
	Coteau Landing.			

Counties on the Northern Bank of the St. Lawrence.

Terrebonne,	{ Terrebonne.	St. Maurice.	Three Rivers.
	{ St. Jerome.	Champlain,	{ Batiscan,
	{ Ste. Therese.		{ St. Anne.
L'Assomption,	L'Assomption.	Portneuf,	Portneuf.
Montcalm,	Rawdon.	Quebec,	Quebec.
Joliette,	Industry.	Montmorency,	Chateau Richer,
Berthier,	Berthier.	Charlevoix,	St. Irene.
Maskinonge	{ Riviere-du-	Chicoutimi,	Chicoutimi.
	{ Loup.	Saguenay,	Tadousac.

Counties on the South Bank of the St. Lawrence.

Huntingdon,	Huntingdon.	Yamaska,	{ Yamaska.
Chateauguay,	{ Ste. Martine.		{ La Bale.
	{ Chateauguay.	Nicolet,	{ Becancour,
Napierville,	{ St. Remi.		{ Nicolet,
	{ Sherrington.	Lotbiniere,	{ Lotbiniere.
St. Johns.	St. Johns.		{ St. Croix.
Beauharnois,	Beauharnois.	Levis,	Point Levis.
Laprairie,	{ Laprairie.	Dorchester,	St. Anselme,
	{ Caughnawaga.	Bellechasse,	St. Michel.
Chambly,	{ Chambly.	Montmagny,	St. Thomas.
	{ Longueuil.	L'Islet,	L'Islet.
Vercheres,	Vercheres.	Kamouraska,	Kamouraska.
Richelieu,	Sorel, St. Ours.	Temiscouata,	Trois Pistoles.
St. Hyacinthe,	St. Hyacinthe.	Rimouski,	Rimouski.
Rouville,	St. Marie.	Gaspé,	Perce.
Iberville,	St. Athanase.	Bonaventure,	New Carlisle.
Bagot,	St. Liboire.		

Eastern Townships.

Missisquoi.	{ Bedford.	Beauce,	{ St. Francois.
	{ Phillipsburg.		{ La Beauce.
Brome,	Knowlton.	Wolfe,	Wolfestown.
Shefford,	Waterloo.	Richmond,	{ Richmond.
Drummond,	Drummondville		{ Sherbrooke.
Arthabaska,	St. Christophe.	Compton,	Compton.
Megantic,	Inverness.	Stanstead,	Stanstead.
			Coaticook.

STRATEGIC GEOGRAPHY.

DEFENCE.

Chief Places.

d } Lachine
 al } Montreal.
 is } St. Vincent
 & } de
 re, } Paul.

Lawrence.

Three Rivers.
 Basilean.
 St. Anne.
 Portneuf.
 Quebec.
 Chateau Richer.
 St. Irene.
 Chicoutimi.
 Tadoussac.

Lawrence.

Yamaska.
 La Bale.
 Beaucecour.
 Nicolet.
 Lotbiniere.
 St. Croix.
 Point Levis.
 St. Anselme.
 St. Michel.
 St. Thomas.
 L'Islet.
 Kamouraska.
 Trois Pistoles.
 Rimouski.
 Perce.
 New Carlisle.

St. Francois.
 La Beauce.
 Wolfestown.
 Richmond.
 Sherbrooke.
 Compton.
 Stanstead.
 Coaticook.

Before deciding on what are the strategic points of most importance and the measures that should be adopted for defence, it is necessary to consider what aggressive operations an enemy would probably undertake, and the natural base and lines of his operations, as well as our own facilities for concentration.

The frontier of the Province of Quebec is contiguous to the territory of the U. S. for a distance of about 450 miles, that is to say, 167 miles of imaginary boundary along the 45th parallel of latitude southward of Montreal and Quebec, running from St. Regis, on the eastern end of Lake St. Francis (an expansion of the St. Lawrence) to the Connecticut River, in the Township of Hereford, abutting on the State of New Hampshire, thence in an irregular line the boundary of the State of Maine, follows the high ground which forms the watershed between the Kennebec River in the U. S. and the Chaudière, a tributary of the St. Lawrence, running N. E. in accordance with the disastrous arbitration of the Ashburton treaty, 1842, which brings the Territory of the State of Maine to within 25 miles of the St. Lawrence, opposite Rivière-du-Loup.

Unfortunately, at this point, the Intercolonial Railway is within an easy ride for a squadron of troopers, who could in a single night destroy the important railroad bridges of this section, and intercept the land transport of troops or supplies from Halifax. From this point the frontier line runs south-east until it meets Dominion Territory in New Brunswick. The disadvantage of having a wedge of foreign territory thrust into our own is not altogether so great as might at first sight be anticipated, the character of the country being for the most part rugged, covered with forest, and thinly populated; there are no natural commercial lines, nor any railroads running through it to the north, the watershed north of the St. John's river being close to the St. Lawrence, prevents the formation of any long or navigable tributaries to the St. Lawrence; there is, there-

Arnold, 1775.

fore, no natural channel for intercommunication or commerce from the northern angle of the State of Maine into Canada. As military lines of operation always follow natural channels, no invasion of Canada has ever been attempted from this point, the nearest to it being that of General Arnold, of the United States, in 1775, and he followed the line of the Kennebec and Chaudière Rivers. On the other hand, in case of offensive operations from Canada, in the direction of the Penobscot valley, or to seize the triple R. R. terminus of Woodstock, Richmond and Houton, leading to St. Johns, N. B., our reentering frontier would form an advantageous base of operations, backed by Quebec and the St. Lawrence, and the Intercolonial Railway. Though the long line (450 miles) of frontier is apparently attackable at all points, the defence of the country, even with its much smaller population, than that of the contiguous States, would with proper forethought and organization be by no means so difficult or impossible a task as some would have us to suppose, for the following reasons:—

GENERAL CONSIDERATIONS IN FAVOR OF SUCCESSFUL DEFENCE.

Vital points
few.

1. Although owing to the length and character of Frontier it is quite impossible and not desirable to protect it throughout its whole length. An enemy must capture and establish himself in some vital points before he could obtain any decided military advantage. There are only a few such points. If they were put into and *maintained* in a proper state of defence, with a small body of regular troops, as the nucleus of a garrison to be furnished by the local Militia, such positions could be held during the five months, in which alone, it is possible for an enemy to carry on operations on the large scale necessary to capture them.

Interior lines.

2. The Province is a long strip of communications, its main artery, the St. Lawrence, being the fosse of a natural fortress, open during the summer season (winter operations may be deemed impracticable in this climate) to the gun boats of Great Britain, and to them

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alone as long as the important fortress of Quebec is kept in a defensive condition. In consequence of the character of the original seignorial settlement of the Province, there are numerous lines of roads running parallel to the St. Lawrence, forming the front and rear of the concessions or seignorial grants of land. ^{seignorial roads.}

The Grand Trunk Railway and others on the South Shore are being supplemented by Railways on the North Shore, with their usual telegraphic lines, the whole form a series of communications, which have always enabled Canadian troops to act upon, what are practically interior lines, and so concentrate readily upon important strategic points, as was proved in the late Fenian raids.

3. The rear of the Province is, of course, perfectly secure, while its left flank is equally so, and rests on England's great base of operations as long as she retains command of the sea, and Quebec of the waters of the St. Lawrence. Unfortunately, the right flank and right centre (Montreal), the objective point where attack would inevitably be made is utterly defenceless, but would cease to be so were the recommendations of Sir W. Jervois carried out. ^{Rear and left secure.} Jervois

4. The severity of the climate would render the hostile occupation of Canadian territory an impracticable operation, which has been only once attempted, in 1775, and ended in disaster to the invading army. The great depth of snow prevents deployment off the beaten tracks and the advantage of numbers is lost. ^{climate.} LeMoine, 1775.

5 The contiguous states though populous are entirely denuded of regular troops, while the State Militia and Volunteers have no connection with the regular forces and are destitute of discipline. The Republican institutions of the country prevent its being a permanent military power, while both parties for political purposes are hostile to the maintenance of genuine military organization. The people of the U. S. have apparently learnt nothing from four years of disaster, bloodshed and the accumulation of an enormous debt. At the close of the late war, 400,000 veterans were thanklessly disbanded. Twelve years have passed, and it would now be impossible to collect the soldiers who have settled in civil life. The very small body of regular troops are scattered over ^{U. S. Troops.}

a vast extent of territory, mostly in the west and south. The officers educated at West Point are excellent leaders, but there are no kindly ties between them and their men, who are mostly foreigners. The strict discipline of West Point never goes beyond the gates of that institution, not through the fault of the officers themselves, who are powerless against the traditions of a Republican Government, which dislikes discipline, even in its armies.

Armament.

6. The armaments of the States are in an unsatisfactory condition, from the fact that the ordnance is not an artillery, but a civil department, which gives contracts to civil firms for cast-iron cannon; cast-iron not being a reliable material for rifled guns, while the Redman smooth bores are ineffective and too cumbersome for offensive operations. Nor does it appear from late reports that the army have much confidence in the small arms issued to them.

7 The cultivated classes of the United States are friendly in feeling towards Great Britain, and the Canadian population are full of loyalty, which could be at any time rendered active in the defence of the country, provided the principal expense and direction was taken by Great Britain.

ENEMY'S BASE—LINES OF OPERATION AND OBJECTIVE.

Enemy's base.

The enemy's principal base of operations would probably be at Albany, the central point from which natural lines of operation lead direct to Montreal, north east to Quebec and westerly to Niagara or Sackets harbour, if Kingston were a secondary objective.

Albany is moreover an arsenal, to which there is access by river, road and railway from all quarters, including the Pennsylvania coal and iron county.

Lines of operation.

Springfield, a small arm factory and Troy also a manufacturing town, both communicating with Albany and New York, would be subsidiary bases for supplies, which could be poured along the Hudson River and Canal, Lake Champlain, and the roads and railroads all converging on the objective point Montreal.

Objective.

The strongly fortified position of Rouses Point at the head of Lake Champlain on the frontier within 40 miles of Montreal, being the final point of concentration for attack upon Montreal the utterly defenceless commercial

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and strategic capital of Canada, to which the Vermont Central and a net work of other railroads converge.

Perhaps no better proof of the absolute certainty of Montreal as an objective, and no more complete idea of the inevitable lines of the United States military operation, can be gained than by a study of the 25 routes advertised to the Centennial Exhibition of 1876, (here- Picard. with appended.)

A glance at the map before the construction of rail-ways show that the mountainous regions of the Adirondacks, &c., the Catskills on the West, the White Mountains and the rugged territory of Maine on the East, restricted communications to the channels of the Hudson, Lake Champlain and the Richelieu Valley, and will explain why history has so often, and will again, repeat itself here as elsewhere. The war-path of the Iroquois and Mohawks was followed by the retaliatory expeditions of the French Canadian voyageur soldiers, and then again by British, Colonial, and United States invasions of Canada, down to the last futile effort of a Fenian mob. The tide of war has ever and always rolled along the channels that nature and art have made it share with commerce and travel. The lately projected Caughnawaga Canal may even yet be constructed to admit United States gun boats up the Hudson from the sea, and so complete the communications of Lake Champlain from New York to the St. Lawrence, for the enemy who having seized the Victoria Bridge and established batteries on the south bank of the River could bombard the Town, resistance would be futile. The wealthy commercial classes of Montreal would have to pay a very heavy contribution towards the subjugation of their country, Canada would be cut in two by the capture of Montreal, which is the head of the sea navigation of the St. Lawrence, and the focus of all communications by land and water between Upper and Lower Canada and the Maritime Provinces, the defence of the country would be severed, Ontario being cut off from Quebec and the Maritime Provinces as well as from any aid from Great Britain. An enemy holding Montreal with its net work of communications converging upon it from his basis of supply, could easily maintain himself in the natural fortress Island on which the city is built, and contain any force com-

Jervois.

Strange.

ing from Ontario, while they proceeded to lay siege to Quebec. The St. Lawrence itself with its tributary of the Richelieu and the roads and railroads following the line of country in a north eastern direction would become fresh lines of communication and supply. The fall of Quebec would lose us the key of the St. Lawrence, and close the only door by which British succour could come to Canada, or a hostile fleet of gunboats enter its inland waters, unless, indeed, reciprocity compels us to enlarge the Caughnawaga Canal, &c. In any case, unpleasant as the truth may appear, Quebec remains the only one possible stronghold, upon which our militia, rolled up by an invading force from the West, could retreat, and wait for that help which never would be denied from the old country. Successful initiative in war is everything. *Both nations are forbidden by treaty to build gunboats on the lakes;* but gunboats can, and have with the first note of war, passed up the St. Lawrence by the Lachine Canal, (now being still further enlarged) and on to the lakes. The Beauharnois Canal, on the South Shore, would be rendered useless at the commencement of hostilities by the United States. But the necessities of commerce, with us stronger than any consideration of national defence, point to the probable enlargement of the old canal on the North Shore, from the Cedar Rapids to Coteau landing. The defenceless emporiums of commerce on the lakes, would then be at the mercy of Great Britain as long as Quebec was held an open port for British gunboats of light draught, or steamers converted into such, which could navigate not only the St. Lawrence, but the Ottawa waters, by the protected inland route to Kingston and Lake Ontario, by the Rideau Canal. For Ontario, trusting in the loyal strength of her militia, to be indifferent to the defence of Lower Canada, and especially of Montreal, resembles a warrior with a good helmet being indifferent about a cuirass for his breast, as long as his head was protected; or the much maligned ostrich, who on the approach of an enemy, stuck his beak in the sand and left his body exposed, believing it invisible. Halifax, admirably selected as a base for aggressive maritime operations against the seaboard of the United States, is useless as a base of operations for

the defence of Canada, from which it is cut off by the State of Maine "If both Quebec and Montreal were put in a proper state of defence, an enemy would be obliged, in aiming at the severance of communication between Ontario and Quebec, the Maritime Provinces and Great Britain, to carry on two extensive expeditions simultaneously, each involving the necessity of a protracted siege, and considering the short period, during which military operations on a large scale can be carried on in this country, there would be every probability of successful resistance." Unfortunately the repeal in 1872 of the act of Confederation entitled the Canada Defence Act, renders the successful defence of Canada a difficult problem. The Act provided for the guaranteed loan of £1,000,000 sterling, for the building of forts round Montreal, as well as the free gift by the Imperial Government of an armament for such forts as might be built at Montreal, also a free gift armament for the Quebec and Levis forts. All of which were declined by the Dominion Government, in favor of a transfer of the guaranteed loan of £1,000,000 to the Canada Pacific Railway.

STRATEGIC POINTS.

After Montreal and Quebec, perhaps the most important point is St. Johns, P. of Q., the site of the old redoubt, commands the Railway Bridge of the Vermont Central, the junctions from Rouses Point, Waterloo and the Passumpsic; the Richelieu river and the roads running north and south, but the advance guard of observation would be at Fort Isle-aux-Noix, close to Rouses Point and St. Albans railroad junction. "To prevent the enemy from passing vessels down the Richelieu river from Lake Champlain, for the transport of troops, stores and material for the attack on Montreal, obstructions (torpedoes,) should be placed in the river on either side of and flanked by the Fort at Isle-aux-Noix. This work and its garrison would no doubt, being in an advanced and isolated position, be liable to be captured at an early period, but it is considered that the delay it would cause an enemy, would more than compensate for the loss that would thereby

Sorel.

be occasioned." The garrison in retreating might destroy the Canal Lock in the Richelieu River; Col. Jervois also considers Sorel, at the mouth of the Richelieu, an important point. Advanced bodies of Militia at Lennoxville and Richmond Railway junction, after keeping the enemy in check, might retire upon Quebec, destroying the railway bridges behind them.

Isle Perrot.

"It is further necessary to provide against attack upon Montreal by a force advancing from the westward, supposing it to have crossed the St. Lawrence, between Lake Ontario and Lake St. Louis. This may best be effected by the construction of works covering the railway bridge near Vaudreuil, at the junction of the Ottawa River with the St. Lawrence. Such works would also act as a "tête du pont," from under cover of which troops might operate westward; they would, moreover, be on the flank of any force of the enemy advancing against Ottawa. In connection with the defensive position at Vaudreuil, temporary works should be constructed on Isle Perrot, which, if some of the spans of the railway bridge between it and the main land were removed, would form a second line of defence; again, by removing some of the spans of the bridge between Isle Perrot and Montreal Island, a third line might be taken up at St. Annes."

Between Vaudreuil and the works immediately covering Montreal, Lake St. Louis and the Lachine Rapids, would be a sufficient defence; gunboats could be brought into the Lake by the Lachine Canal, which is being widened. Any vessels of war that were brought into Lake St. Louis would also be of assistance in the defence of the left flank of the works at Vaudreuil; and if the St. Ann's Lock and the passage near it, between St. Louis and the Lake of the Two Mountains, were made sufficiently large to take such vessels through, they could also aid in the defence of the right flank of those works. They could, moreover, operate in the channel on the north side of Montreal Island, or proceed up the Ottawa and down the Rideau Canal into Lake Ontario.

For the protection of communications by the Lachine Railway and Canal, works should be constructed at Caughnawaga Caughnawaga, on the right bank of the St. Lawrence,

nearly opposite the junction of the Lachine Canal with Lake St. Louis, and near the terminus of the Railway from Plattsburg. These works would also afford the means of throwing a force across the river to act upon the left flank of the enemy operating against Montreal, should circumstances be favourable for such a movement, they could also guard the entrance to the Beauharnois Canal.

The Island of St. Helen's, upon which rifled guns St. Helen's. should be mounted, would form a keep to an intrenched camp, covering Montreal. On this Island is also the main depot for tools, stores, guns, arms and munitions of war for Montreal and the neighbourhood, it is unfortunately without protection since the barracks formerly occupied by a detachment from the Quebec Gunnery School were burnt. Many thousand stands of rifles, as well as a considerable amount of powder in the magazine are at the mercy of a handful of raiders, who (even if armed only with revolvers) could carry off the arms and blow up the magazine before the militia of Montreal could be assembled and transported across the river. Taking up a few rails on the Victoria Bridge, would prevent immediate pursuit and might lead to serious disaster if done surreptitiously.

MARITIME ATTACK.

Great Britain having so long had command of the sea, maritime attack upon her territory has not been much considered. But the police of the ocean, as carried out by the swarms of cruisers in the days of Nelson, or the swift wooden steamers of a later date, must be considered from a very different point of view, when the British fleet consists of iron-clads, the available number of which, for cis-Atlantic service, might be counted on the fingers. Such complications might arise as would necessitate the concentration of our fleet in Eastern rather than Western waters,—while an enemy's vessels that would not dare to meet ours on the high seas, might take shelter in friendly American ports before the declaration of hostilities, and seize an opportunity to attack our undefended coasts and com-

mercantile shipping, bombarding Quebec from a safe point behind Indian Cove, or running past it. There is no armament or torpedos to stop an iron-clad, and even a wooden vessel, (privateer with rifled guns), might run past to Montreal and burn or lay it under contribution, before a British iron-clad could ascend the St. Lawrence, by which time the privateer's crew could blow up their comparatively valueless vessel, and escape to the U. S. with their plunder. But to those who were not so venturesome, there would be plenty of opportunity to harass and plunder our fishing stations and small ports on the Gulf. Or if the U. States were hostile, the St. Lawrence being now open to them, they might run past Fort Henry, at Kingston, or destroy it by an expedition from Sacket's Harbour, and run down to the Gulf, levying contributions on the way. The irritation due to losses, if caused even indirectly through Imperial connexion, would perhaps not be altogether allayed by the consideration of the fact that the colony had taken no steps in her own defence.

OFFENCE.

Often the best defence is offence, but Canada does not contain within herself the elements necessary to the initiative in war, though her localized militia system and the character of the country, which is a riband of land and water communications, would facilitate the concentration and launching of an offensive force, which might surprise even 40,000,000 of unarmed people, who have hitherto relied upon their ever successful diplomacy. Parliamentary Governments are not however suited to a decisive initiative, and when the expenses would have to be shared by the Imperial and Dominion Governments, divided control would be a natural result, rendering initiative perilous if not impossible. Great Britain's natural base of operations, (the sea), gives the advantage of enabling her to shift her secondary bases almost at will. A combined military and naval force, therefore, started from Canada at the first declaration of hostilities, might by seizing Rouses Point, start with extemporized gunboats down the Richelieu, the Canal,

Lake Champlain and the Hudson, bombarding Burlington, Albany, and other emporiums of commerce, but neglecting any attempt at keeping open their lines of communication with Canada, passing West Point which has no garrison and could not stop a flotilla, (with dredges for torpedo wires moving along both banks), they might push on to the Atlantic coast, as Sherman did, and seize New York or Boston, there to co-operate with the British fleet, which could support them and form a fresh base of operations. The whole of the Atlantic seaboard would be at the mercy of the English fleet, as the United States have not a gun mounted that could pierce any average British Ironclad, nor have they an efficient naval force. A navy is not improvised, especially when an enemy's men-of-war are bombarding and destroying the dockyards. A diversion might also be made on the Western Lakes, for though both nations are by Treaty forbidden to build gunboats on the Lakes, if Great Britain chose to take the initiative, her gunboats could cross the Atlantic and ascend the St. Lawrence, especially if the old canal from Cedar Rapids to Coteau Landing, was reconstructed. The Beauharnois Canal on the south shore would probably be destroyed by the United States. The Lachine Canal is being enlarged, and a second more secure line of gunboat communication could be run up the Ottawa and by the Rideau Canal, for offensive operations on Lake Ontario. Thirdly, an expedition from India might land a force of British troops and a contingent of Sikhs at San Francisco. There are growing causes of disunion, based on diversity of interest, arising between the Western and Eastern as well as the Northern and Southern States.

Thus the United States (prevented from having either military or naval forces of any magnitude, by both political parties, who use the watchword of decreased war expenditure) might find herself attacked N., S., E., and West, if Great Britain found herself forced to resort to a vigorous war initiative.

BOOKS OF REFERENCE

ON

SECTION "A"

BOOKS OF REFERENCE

MODE OF REFERENCE.	FULL TITLE, &c.	REMARKS.
Appleton.	Railway and Steam Navigation Guide, published in New York, 849 and 551 Broadway, and 18 Little Britain, London.	Containing tables of the Railways of the United States and Canada, with 100 Railway maps.
Bouchette.	A Topographical description of Lower Canada, with remarks upon Upper Canada, and on the relative connection of both provinces with the United States of America, by Col. Bouchette, Surveyor General of Lower Canada, published in London in 1815.	An old but excellent work, with maps, in the Library of the Literary and Historical Society of Quebec.
Bayfield.	Admiralty Charts.	
Campbell.	Modern Geography and Atlas, authorized by the Council of Public Instruction, P. of Q., published by James Campbell & Son, Toronto, 1875.	A small work for the use of Schools, but correct and up to date.
Jervois.	Confidential Report on the Defence of Canada, by Lt. Col. Jervois, R. E., Director of Fortifications, War Office, 1865, London, printed by Eyre & Spottiswoode.	Answers to questions from the Executive Council of Canada.
James.	Frontier of Canada East.	Zincographed at the Topographical Department of the War Office, Southampton; scale 1 inch to a Statute mile.
Kingsford.	Map of Railway systems of Eastern Province of Canada.	Published by authority of Minister of Public Works, Ottawa, 1876.
Logan.	Geological Survey of Canada, Dawson, Bros., Montreal, 1861.	A very complete work with Geological Atlas, with plans and sections in Library of the Literary and Historical Society, Quebec.
Ordnance Survey.	Maps of Ordnance Survey, Canada East.	Scale, $\frac{1}{25000}$ or 25.344 inches to a mile.

ON SECTION "A."

MODE OF REFERENCE.	FULL TITLE, &c.	REMARKS.
Picard, F.	Vermont Central Railway Agency, Map, 86 St. James St., Montreal.	Twenty-five routes to and from Canada to the Centennial Exhibition, Philadelphia.
Strange.	Artillery Retrospect of the last great war, 1870, with its lessons for Canadians, published by Dawson & Co., Quebec, 1874, and Mitchell & Co., Charing Cross, London.	A Pamphlet.
Strange and Le moine.	Historical notes on the Defence of Quebec, 1775.—Papers of the Literary and Historical Society of Quebec, 1875.	Pamphlet.
Snow & Bradlee.	Topographical map of White Mountains, in relief. Published by G. K. Snow & Bradlee, Boston.	Relief Map—Horizontal scale 1 in 400,000; vertical scale 1 in 135,333.3. Relief maps of other portions of the United States, executed in like manner, may also be obtained.
Tache.	Carte de la Province de Quebec dressée au Département des Terres de la Couronne, 1870.	Good maps, but mountain ranges incomplete.
Tache.	Official Census of Canada, 1871, published at Ottawa.	Statistics of population—Superficies of land and water, products, &c.
Walker and Mills.	New Standard Atlas, Dominion of Canada.	Describing Provinces, Counties, Cities, Railroads, Post Offices, &c., 1875. Published at Montreal and Toronto.